**Download file, open it in PowerPoint, and click on "View / Notes Page" to see the transcript of CDR Witt's presentation.**

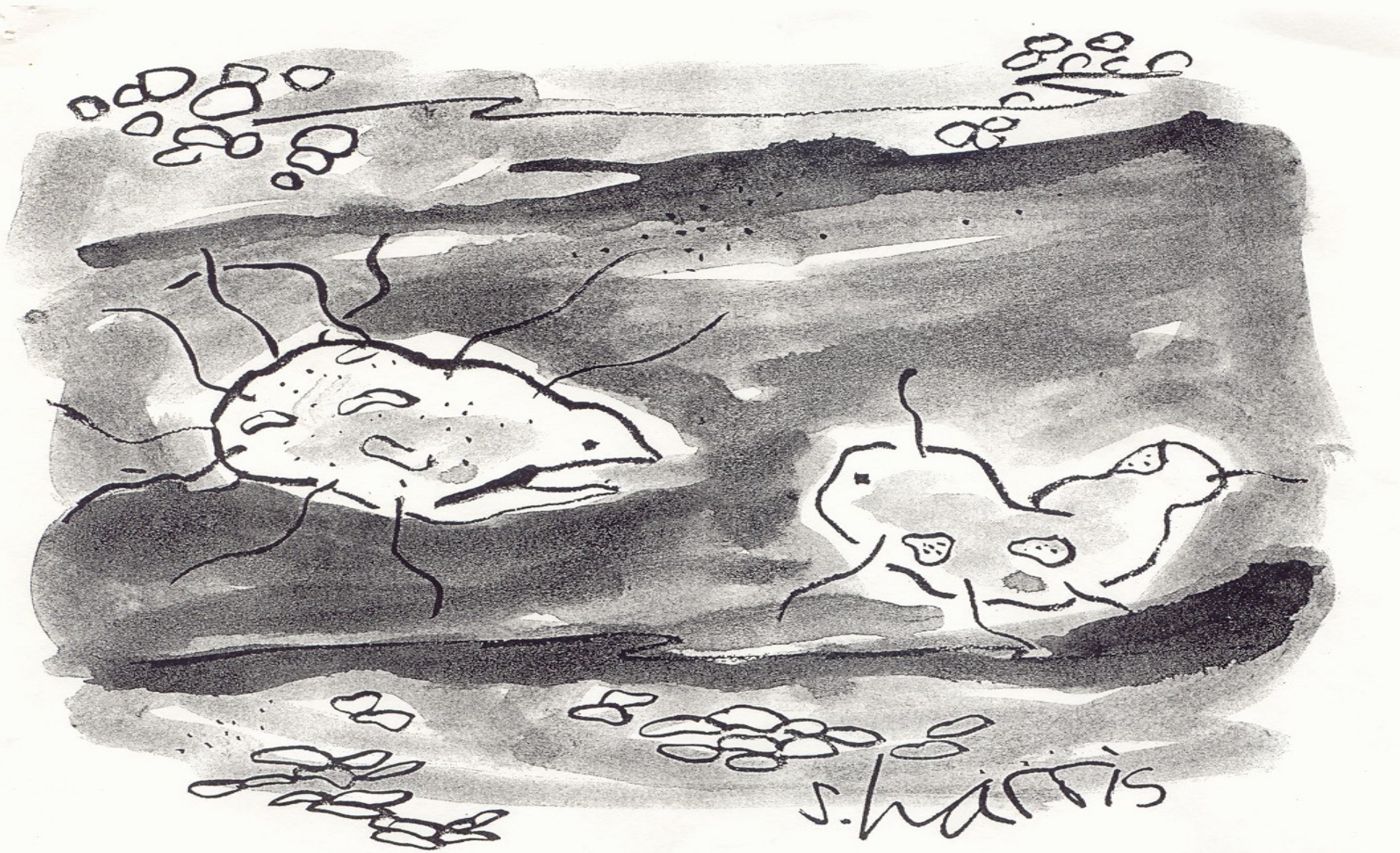
# Antimicrobial Resistance Surveillance

Force Health Protection Conference
Baltimore MD
13 August 2002

CDR Clara J. Witt, USPHS

Chief, Foodborne, Veterinary and Antimicrobial Resistance Surveillance

DoD Global Emerging Infections System




"WHAT I REALLY HATE IS PREVENTIVE MEDICINE. THEY GO AFTER US BEFORE WE EVEN DO ANYTHING."

# What is Antimicrobial Resistance (AR)?

- A biological phenomenon where bacteria multiply in the presence of an antibiotic given at a higher than therapeutic dose*
- Can be in an entire species of bacteria or may emerge in strains of susceptible species
- Three stage process
  - proaction
  - acquired response
  - selection

All antibiotics can elicit resistance

* WHO Global Strategy for Containment of Antimicrobial

# AR Emergence Is an Interplay

Genetics

- Mutation
- DNA transfer

Phenotypic expression through

- Inactivation of the drug – penicillin, chloramphenicol
- Expulsion of the drug from the bacteria – tetracycline
- Substitution for a blocked target molecule – sulfonamide, trimethoprim
- Altered affinity for the drug – quinolones, Beta-lactams

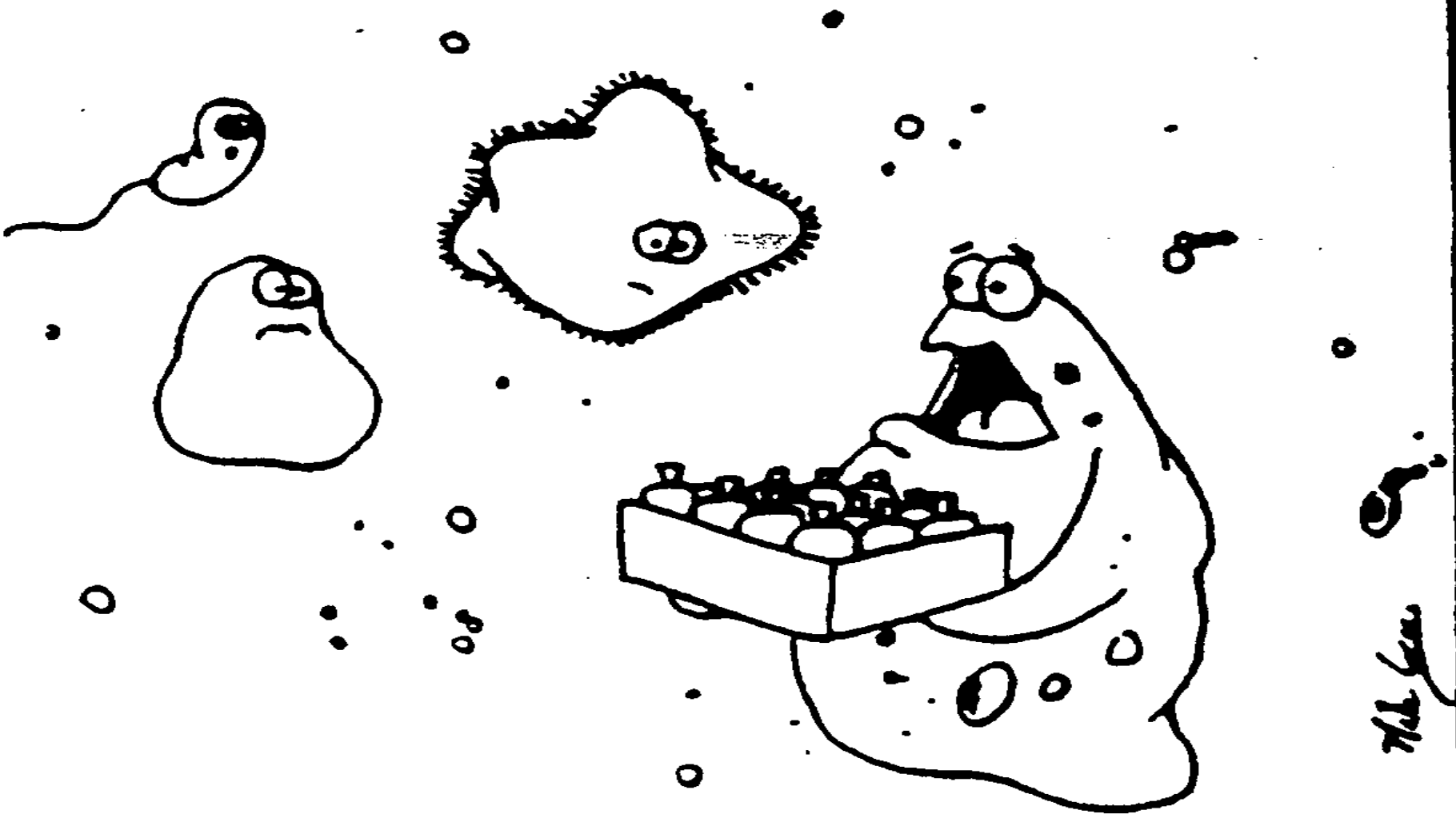
# Examples of AR

- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Vancomycin resistant enterococci (VRE)
- Penicillin-, tetracycline- and quinolone-resistant *Neisseria gonorrhoeae*
- Multi-resistant S*higella, Salmonella* and *Campylobacter* species

# The Force Health Threat of AR

- Naturally occurring or bioterrorism-associated
- Leads to
  - increased duration and severity of morbidity (nosocomial and community-acquired infection)
  - decreased force productivity and strength
  - increased health care expenditures
  - shrinkage of antimicrobial armamentarium

# Lab Laughs by Mike Cross



"Get your resistance pill now! There's a new antibiotic out!"

# Factors Contributing to AR

Natural phenomenon

Usage of Antimicrobials

- Over
  - ICU
  - new drug promotion
  - mass prophylaxis
- Under
  - dose
  - duration
  - counterfeit
- Inappropriate
  - self medication
  - wrong drug-bug combination
- Non-medical
  - animal husbandry
  - aquaculture
  - horticulture

# Surveillance

Regular, ongoing collection and analysis of health-related data conducted to monitor the frequency of occurrence and distribution of disease or a health condition in a population

Performed to

- detect the occurrence of a health event
- provide information for its prevention or control
- improve health of population from whom the data were collected

Surveillance is unnecessary if the data and information gained are not used

# AR Surveillance

Objective - provide information for

- Management of bacterial infection to minimize patient morbidity and mortality (clinical application)
  - choice of drug
- Containment of emergence and spread of AR in pathogens (public health application)
  - communicable disease prevention and control
  - drug formulary/purchasing decisions
  - drug use policies and recommendations

In concert these lead to the ultimate goal:

More prudent use of antibiotics for improved human health

# AR Surveillance

Based on the acquisition and reporting of reliable data

- Standardized
- Quality controlled
- Non-duplicative

Depends on

- Obtaining appropriate specimens from the infected individual
- Successful identification and isolation of the causative organism
- Accurate determination of AR in the isolate
- Data transformation into useful information for action

# AR Surveillance System

The design of the system can be active, passive, comprehensive, selective, etc., depending on its ultimate purpose and funding

All AR surveillance systems should produce

- Timely and accurate data
- Easily accessible and interpretable reports, including limitations
- Relevant information for clinicians and policy-makers

  (priority agents and drugs)
- Ability to discriminate between true AR emergence and artifact
- Insight on micro- and macro-trends

# AR Surveillance

data information

Transformation of data into information

- Requires a complex algorithm for expert retrieval, review, resolution and analysis
- Is labor-intensive if done manually

You are here

# DoD-GEIS / Focus Technologies CRDA

TSN® (The Surveillance Network)

- Merges clinical microbiology practices with Internet technology using the existing CHCS system
- Provides laboratory Continuous Quality Improvement via virtual access to expert consultants, daily if required
- Transforms validated AR data into timely and clinically relevant information
- Suggests recommendations on antibiotic use in the MTF and eventually DoD-wide

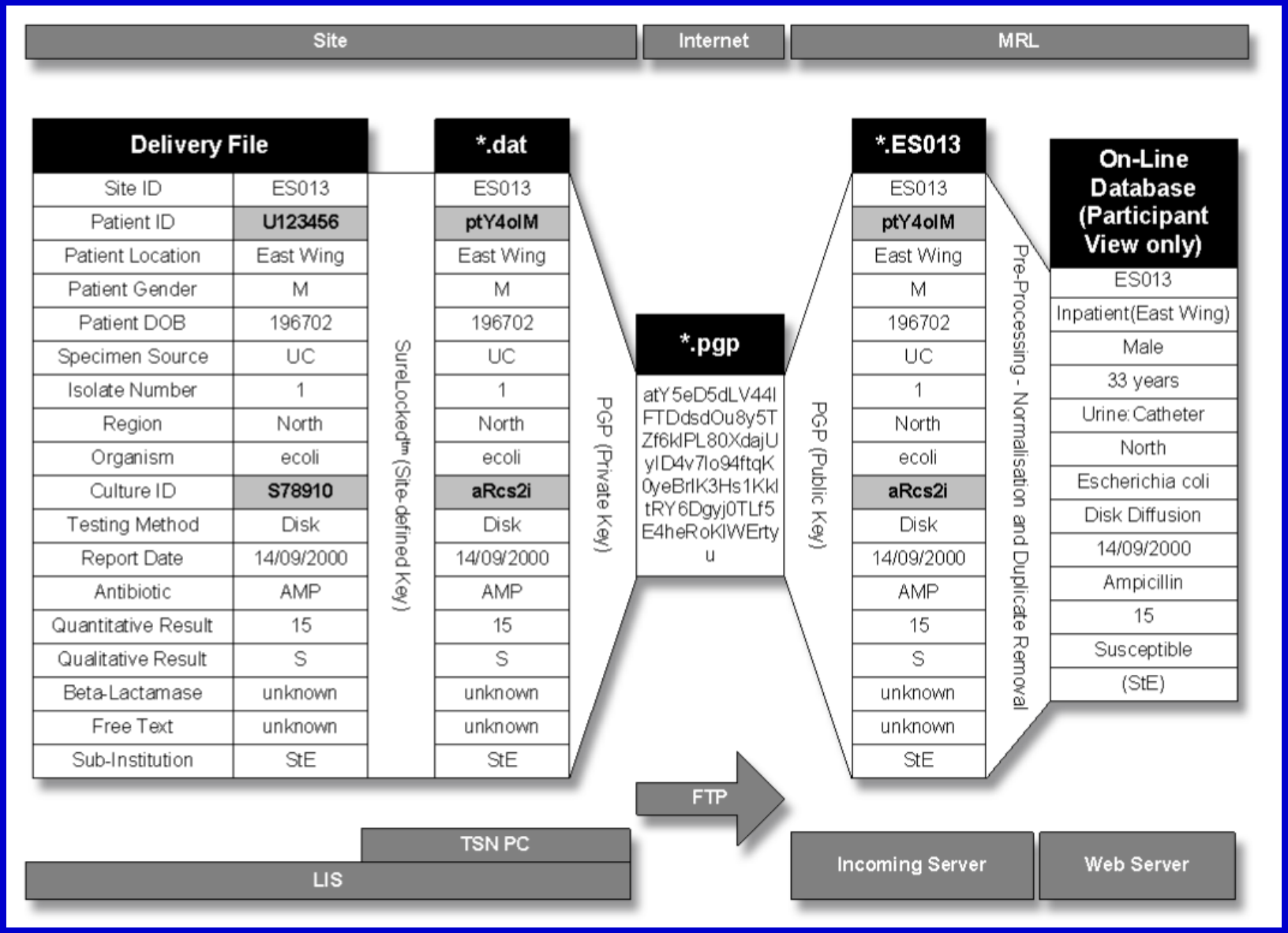
# TSN® Features

- Data pushed to TSN by CHCS daily
- Data put through computerized QC filters and interpretative algorithms
  - Identifies duplicate strains
  - Abides by National Committee for Clinical Laboratory Standards
  - Continuous assessment for correctness, consistency and epidemiologic significance
- Atypical results flagged for expert review
- Emerging resistance trends identified

# TSN® Features

- Both ad hoc and scheduled interactive reports
  - On MTF, region, national, DoD-wide information
- 365/7/24 Internet password-protected access
- Most queries answered in < 30 seconds
- Consultative phone or e-mail follow-up when needed
- Accurate and timely MTF-specific antibiograms and formulary reviews

# DATA SECURITY



# DATA STREAM EXAMPLE

IT054~QU63~RIANIMAZIONE~M~05/11/1916~ASPIRATO TRACHEALE~1~Central~STAPH. AUREUS~PX92~Disk
~10/14/2000~CEFALOTINA~<=1~S~Unknown~ICU~CMA
IT054~QU63~RIANIMAZIONE~M~05/11/1916~ASPIRATO TRACHEALE~1~Central~STAPH. AUREUS~PX92~ Disk
~10/14/2000~CLARITROMICINA~<=0.25~S~Unknown~ ICU ~ CMA
IT054~QU63~RIANIMAZIONE~M~05/11/1916~ASPIRATO TRACHEALE~1~Central~STAPH. AUREUS~PX92~ Disk
~10/14/2000~CEFTRIAXONE~16~I~Unknown~Unknown~ CMA
IT054~QU63~RIANIMAZIONE~M~05/11/1916~ASPIRATO TRACHEALE~1~Central~STAPH. AUREUS~PX92~ Disk
~10/14/2000~GENTAMICINA~>=16~R~Unknown~ ICU ~ CMA
IT054~QU63~RIANIMAZIONE~M~05/11/1916~ASPIRATO TRACHEALE~1~Central~STAPH. AUREUS~PX92~ Disk
~10/14/2000~LOMEFLOXACINA~>=8~R~Unknown~ ICU ~ CMA
IT054~RT39~CAUH02 II° MI OSP~F~04/21/2000~TAMPONE FARINGEO~1~Central~PSEUDOMONAS AERUGINOSA~
PX93~ Disk ~10/14/2000~TRIMETH/SULFA 1/19~> 2~R~Unknown~ I ~HGR
IT054~RT39~CAUH02 II° MI OSP~F~04/21/2000~TAMPONE FARINGEO~1~Central~PSEUDOMONAS AERUGINOSA~
PX93~ Disk ~10/14/2000~TETRACICLINA~>=16~R~Unknown~ I ~HGR
IT054~RT39~CAUH02 II° MI OSP~F~04/21/2000~TAMPONE FARINGEO~1~Central~PSEUDOMONAS AERUGINOSA~
PX93~ Disk ~10/14/2000~PIPERACILLINA~<=16~S~Unknown~ I ~HGR
IT054~RT39~CAUH02 II° MI OSP~F~04/21/2000~TAMPONE FARINGEO~1~Central~PSEUDOMONAS AERUGINOSA~
PX93~ Disk ~10/14/2000~AMPICILLINA~> 16~R~Unknown~ I ~HGR
IT054~RT39~CAUH02 II° MI OSP~F~04/21/2000~TAMPONE FARINGEO~1~Central~PSEUDOMONAS

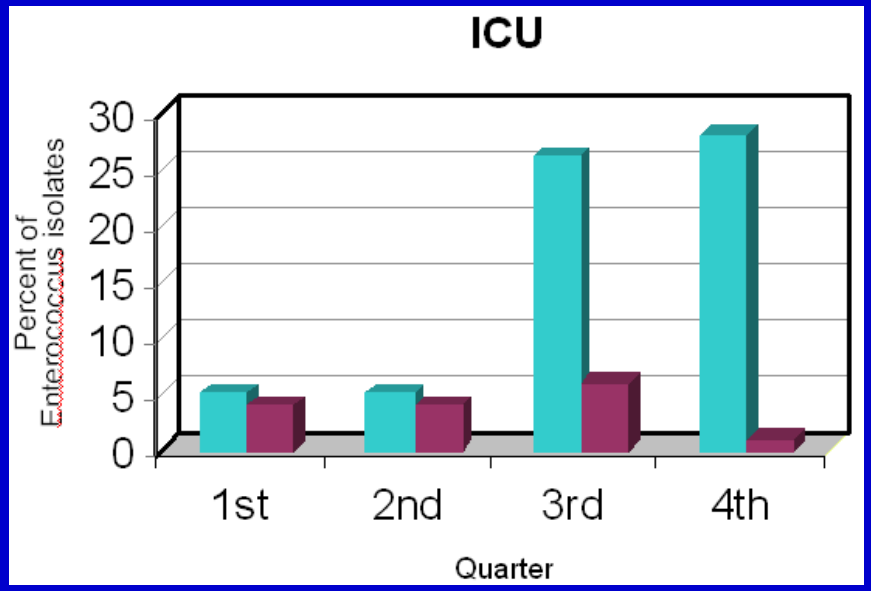
# Advantages of TSN® Approach

- Passive expansion of lab’s QC activities
- Maintains patient and MTF privacy and confidentiality through CHCS data entry
- Continuous Quality Improvement provided to lab through virtual access to network’s expert consultants

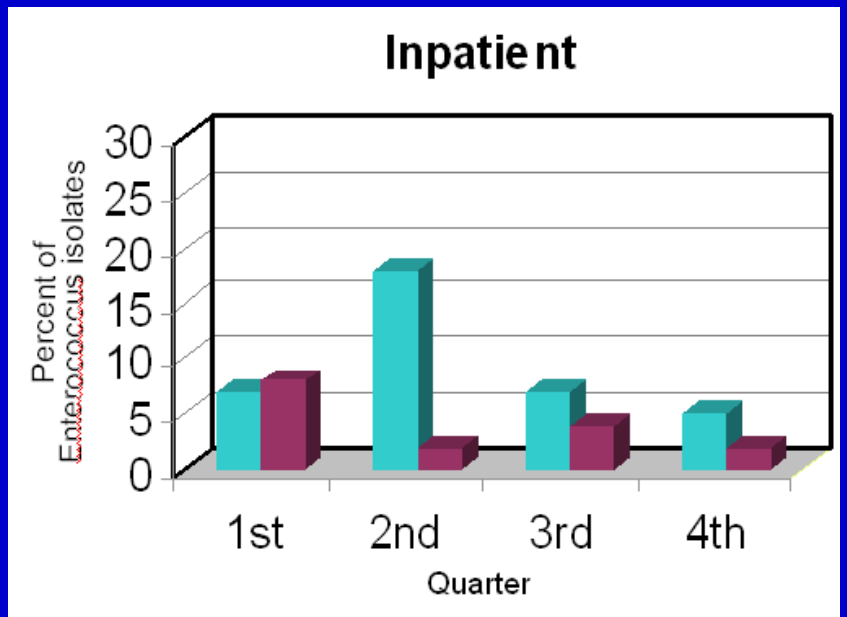
# TSN® Benefits to Military Treatment Facilities

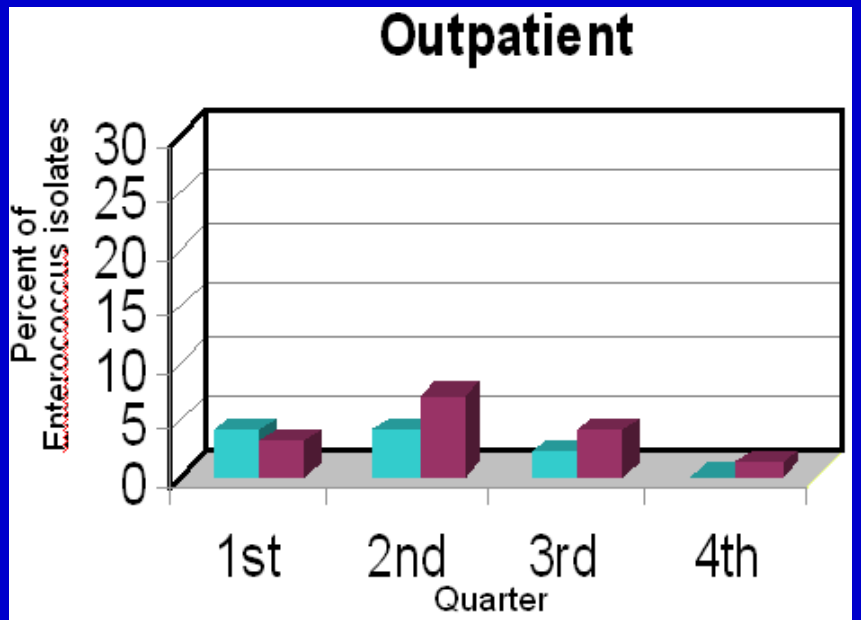
- Optimizes lab time and labor
- Helps determine test panels
- Enhances clinician ability to make relevant empirical choices, reducing the overall costs of patient care
- Enables forward planning of AR contingency protocols for infection control

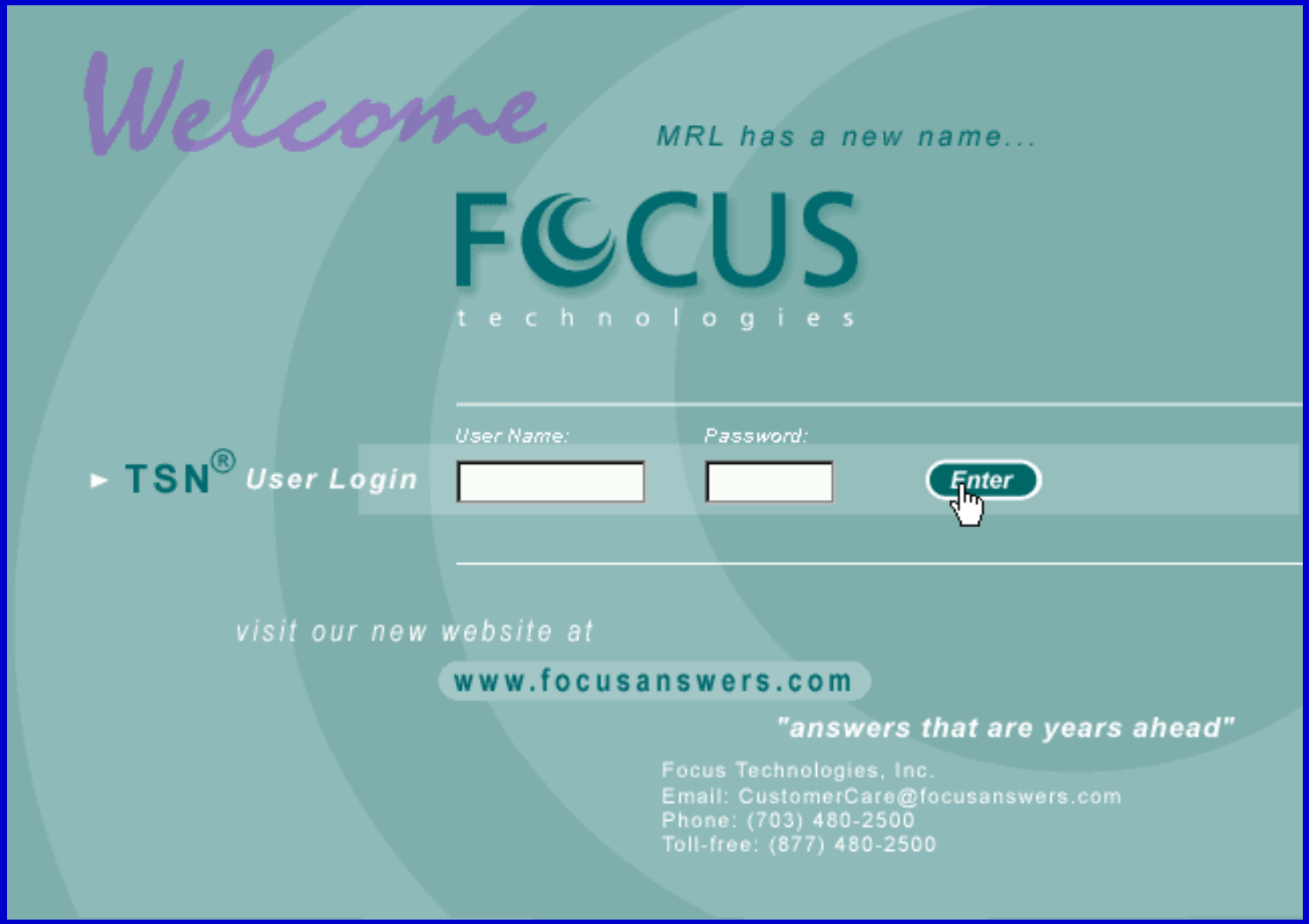
# Outbreak of Vancomycin Resistance in an MTF

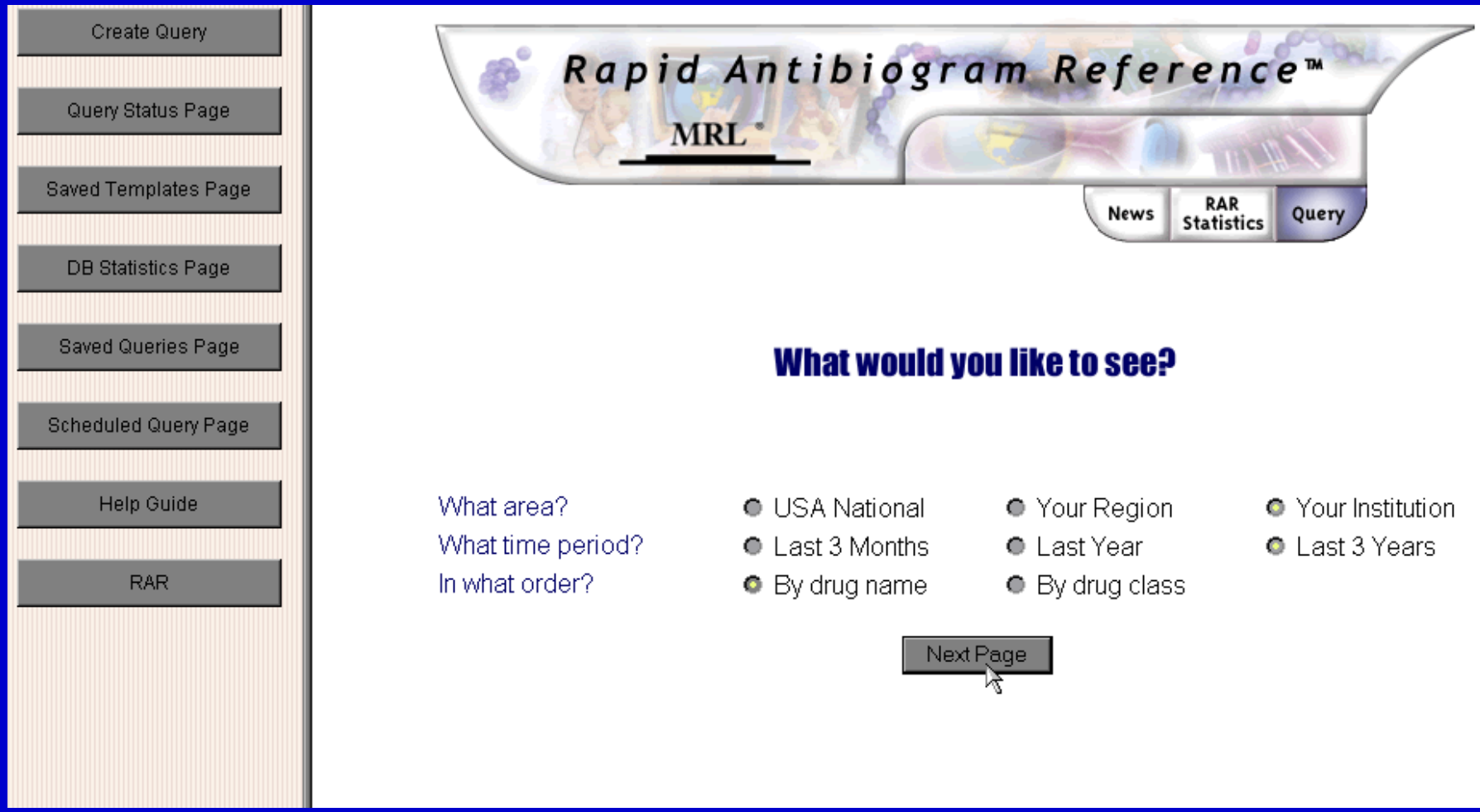



2001
2000




Welcome
MRL has a new name...
FOCUS
technologies
► TSN® User Login
User Name:
Password:
Enter
visit our new website at
www.focusanswers.com
"answers that are years ahead"
Focus Technologies, Inc.
Email: CustomerCare@focusanswers.com
Phone: (703) 480-2500
Toll-free: (877) 480-2500


Create Query
Query Status Page
Saved Templates Page
DB Statistics Page
Saved Queries Page
Scheduled Query Page
Help Guide
RAR
Rapid Antibiogram Reference™
MRL
News
RAR Statistics
Query
What would you like to see?
What area?
USA National
Your Region
Your Institution
What time period?
Last 3 Months
Last Year
Last 3 Years
In what order?
By drug name
By drug class
Next Page

Create Query
Query Status Page
Saved Templates Page
DB Statistics Page
Saved Queries Page
Scheduled Query Page
Help Guide
RAR
Rapid Antibiogram Reference™
MRL
Select from the list of most common organisms
Staphylococcus hominis
Staphylococcus saprophyticus
Staphylococcus simulans
Staphylococcus species, (coagulase negative)
Staphylococcus warneri
Stenotrophomonas (Xanthomonas) maltophilia
Streptococcus Group D (non-enterococcus)
Streptococcus agalactiae
Streptococcus pneumoniae
Streptococcus viridans group
Run Query
or from the complete list of organisms
Acinetobacter baumannii
Acinetobacter lwoffii
Acinetobacter species
Aeromonas caviae
Aeromonas hydrophila
Alcaligenes (Achromobacter) xylosoxidans
Alcaligenes faecalis
Alcaligenes species
Bacteroides distasonis
Bacteroides fragilis
Run Query

Rapid Antibiogram Reference™

MRL®

# Streptococcus pneumoniae

**4 antimicrobial agents**

**W A cal Center**

**01-JUN-1999 to 31-MAY-2002**

| | |
|---|---|
| Organism is less than 60% susceptible to agent | Susceptiblity data for Rapid Antibiogram Reference (RAR ®) is taken from TSN ® Database-USA and from studies performed in Focus Technologies laboratories. Data is to be used for epidemiological purposes only. Differences in susceptibility results may exist across regions and/or between institutions. |
| Organism is between 60% and 90% susceptible to agent | |
| Organism is more than 90% susceptible to agent | |

| Antimicrobial Class | Antimicrobial Agent | | Susceptible | Intermediate | Resistant |
|---|---|---|---|---|---|
| Cephalosporin Third | Cefotaxime | N | 172 | 26 | 8 |
| | | % | 83.5 | 12.6 | 3.9 |
| Glycopeptide | Vancomycin | N | 214 | 0 | 0 |
| | | % | 100.0 | 0.0 | 0.0 |
| Penicillin | Oxacillin | N | 14 | 0 | 6 |
| | | % | 70.0 | 0.0 | 30.0 |
| | Penicillin | N | 113 | 58 | 35 |
| | | % | 54.9 | 28.2 | 17.0 |

New Query New Organism

MMWR Weekly
July 5, 2002 / 51(26);565-567

# *Staphylococcus aureus* Resistant to Vancomycin --- United States, 2002

*Staphylococcus aureus* is a cause of hospital- and community-acquired infections (*1,2*). In 1996, the first clinical isolate of *S. aureus* with reduced susceptibility to vancomycin was reported from Japan (*3*). The vancomycin minimum inhibitory concentration (MIC) result reported for this isolate was in the intermediate range (vancomycin MIC=8 μg/mL) using interpretive criteria defined by the National Committee for Clinical Laboratory Standards (*4*). As of June 2002, eight patients with clinical infections caused by vancomycin-intermediate *S. aureus* (VISA) have been confirmed in the United States (*5,6*). This report describes the first documented case of infection caused by vancomycin-resistant *S. aureus* (VRSA) (vancomycin MIC ≥32 μg/mL) in a patient in the United States. The emergence of VRSA underscores the need for programs to prevent the spread of antimicrobial-resistant microorganisms and control the use of anti-microbial drugs in health-care settings.

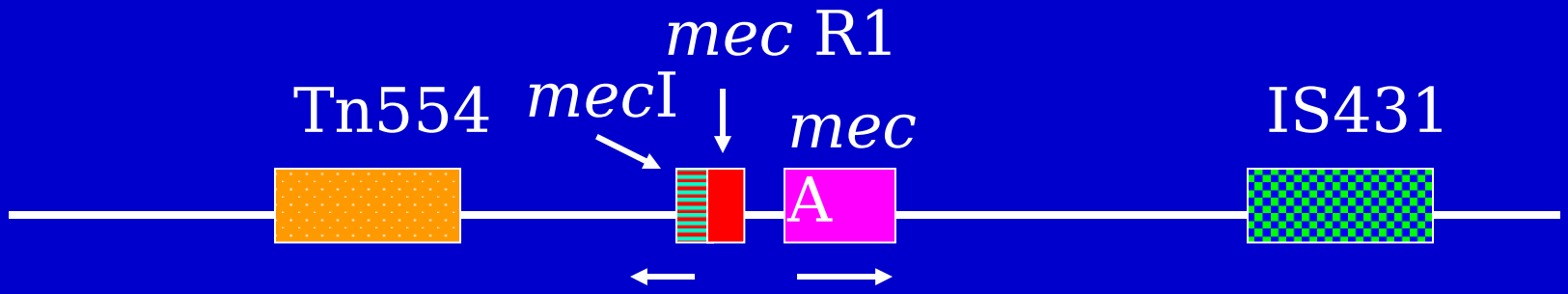
In June 2002, VRSA was isolated from a swab obtained from a catheter exit site from a Michigan resident aged 40 years with diabetes, peripheral vascular disease, and chronic renal failure. The patient received dialysis at an outpatient facility (dialysis center A). Since April 2001, the patient had been treated for chronic foot ulcerations with multiple courses of antimicrobial therapy, some of which included vancomycin. In April 2002, the patient underwent amputation of a gangrenous toe and subsequently developed methicillin-resistant *S. aureus* bacteremia caused by an infected arteriovenous hemodialysis graft. The infection was treated with vancomycin, rifampin, and removal of the infected graft. In June, the patient developed a suspected catheter exit-site infection, and the temporary dialysis catheter was removed; cultures of the exit site and catheter tip subsequently grew *S. aureus* resistant to oxacillin (MIC >16 μg/mL) and vancomycin (MIC >128 μg/mL). A week after catheter removal, the exit site appeared healed; however, the patient's chronic foot ulcer appeared infected. VRSA, vancomycin-resistant *Enterococcus faecalis* (VRE), and *Klebsiella oxytoca* also were recovered from a culture of the ulcer. Swab cultures of the patient's healed catheter exit site and anterior nares did not grow VRSA. To date, the patient is clinically stable, and the infection is responding to outpatient treatment consisting of aggressive wound care and systemic antimicrobial therapy with trimethroprim/sulfamethoxazole.

The VRSA isolate recovered from the catheter exit site was identified initially at a local hospital laboratory using commercial MIC testing and was confirmed by the Michigan Department of Community Health and CDC. Identification methods used at CDC included traditional biochemical tests and DNA sequence analysis of *gyrA* and the gene encoding 16S ribosomal RNA. Molecular tests for genes unique to enterococci were negative. The MIC results for vancomycin, teicoplaninin, and oxacillin were >128 μg/mL, 32 μg/mL, and >16 μg/mL, respectively, by the broth microdilution method. The isolate contained the *vanA* vancomycin resistance gene from enterococci, which is consistent with the glycopeptide MIC profiles. It also contained the oxacillin-resistance gene *mecA*. The isolate was susceptible to chloramphenicol linezolid, minocycline, quinupristin/dalfopristin, tetracycline, and trimethoprim/sulfamethoxazole.

Epidemiologic and laboratory investigations are under way to assess the risk for transmission of VRSA to other patients, health-care workers, and close family and other contacts. To date, no VRSA transmission has been identified.

Infection-control practices in dialysis center A were assessed; all health-care workers followed standard precautions consistent with CDC guidelines (7). After the identification of VRSA, dialysis center A initiated special precautions on the basis of CDC recommendations (8), including using gloves, gowns, and masks for all contacts with the patient; performing dialysis with a dedicated dialysis machine during the last shift of the day in an area separate from other patients; having a dialysis technician dedicated to providing care for the patient; using dedicated, noncritical patient-care items; and enhancing education of staff members about appropriate infection-control practices. Assessment of infection-control practices in other health-care settings in which the patient was treated is ongoing.

# Organization of the *mec* Region of DNA
(30 – 50 kb)




- *Mec*A contains the PBP2a gene for methicillin resistance, working in concert with *fem* genes.
- Tn554 is a transposon for inducing erythromycin resistance.
- IS431 is an insertion-like element that serves for homologous recombination with other resistance determinants, TSX, fluoroquinolones, aminoglycosides, tetracyclines, macrolides.
- *Mec*I represses *mec*A transcription.
- *Mec*I, *Mec*R1 induces methicillin resistance in

## Select the Query Type

SIR

Next Step

| Query Type | Query Description |
|---|---|
| **SIR:** | An organism(s) and drug(s) query showing percentages for susceptible (S), intermediate (I), and resistant (R); query can be converted to Trend showing each organism / drug SIR results individually |
| **Trending:** | An organism(s) and drug(s) vs. time query. User defines comparison subject and inclusion of results with S or R or neither; organism / drug results shown combined as defined by user |
| **Antibiogram:** | An organism(s) and drug(s) query. User defines antibiogram report type (S only, R only, S and I, R and I). |
| **Antibiogram- Export Only:** | An export only version of the antibiogram report with enhanced formatting. Because of the enhanced formatting of this query, the results cannot be viewed in HTML. The report must be exported to Excel, Word, Crystal Reports, or Rich Text Format. |
| **MIC Data Distribution:** | An organism(s) and drug(s) distribution report showing uninterpreted MIC values(s) |
| **Zone Size Data Distribution:** | An organism(s) and drug(s) distribution report showing uninterpreted zone size values(s) |
| **Incidence:** | An organism(s) OR drug(s) query showing a count of the number of results, strains , or patients for the selected organism(s) or drug(s); query can be converted to Trend showing each organism or drug individually. |

Create Query

Query Status Page

Saved Templates Page

DB Statistics Page

Saved Queries Page

Scheduled Query Page

Help Guide

RAR

# Query Parameters

**Check any additional criteria you want to include in your query.**
**You are not required to make any selections on this page.**
**You will be able to modify query parameters prior to submitting a query.**
**Hit the "Next Step" button when finished.**

Next Step

| | |
|---|---|
| ☑ S,I,R Phenotype Subselect | S,I,R Phenotype is used to select for specific subgroups such as MRSA and VRE. Select a phenotype subselect drug(s) and activity (S,I,R) after you have entered the Organism(s) and Drug(s) for your chosen query. Note:This option should NOT be selected for a general SIR query. |
| ☐ Specimen Source | General description of source of specimens used in TSN- Ex: Blood: Blood, Resp.-L: Sputum |
| ☐ Patient Type | General description of type of patient- Inpatient, Outpatient, Inpatient-ICU, etc |
| ☐ Patient Ward | Free text of specific patient location (ward/service) as provided to TSN; wildcard characters allowed |
| ☐ Patient Age | Age of patient in years |
| ☐ Patient Gender | Male, Female, or Unknown |
| ☐ Institution Type | General description of institution type- University Hospital, Community Hospital, Reference Lab, etc |
| ☐ Bed Size | Grouping of number of beds in institutions- 100-299, 300, 499, etc |
| ☐ Test Method | Susceptibility test method used- Vitek, MicroScan Walkaway, etc |

# Select the Drug(s) for this Query

Scroll to the bottom of the page and hit "Next Step" when finished.

Select the Drug set; the default set loaded is "MRL Top 25"

MRL Top 25 | Select

Select breakpoint NCCLS

Add Drug(s) to selected set: multiple selections allowed

**You must select at least 1 item before hitting *Add* or *Remove*.**

**Maximum Selection: 25 items** **Currently Selected: 5 item(s)**

| **Options** | All>> | <<All | **Selected** |
|---|---|---|---|
| Amikacin<br>Amoxicillin/clavulanate<br>Ampicillin<br>Ampicillin/sulbactam<br>Cefazolin | | | Ciprofloxacin<br>Erythromycin<br>Penicillin<br>Tetracycline<br>Vancomycin |
| | Add>> | <<Remove | Next Step |

Individual Result ◉ Combined Result ○

Save selected options as a set, delete a user defined set, create a new set

Save Set | Delete Set | New Set

# Organisms vs. Antimicrobial Agents (%S,I,R) Report

**Report Name:** demo all Sa institute

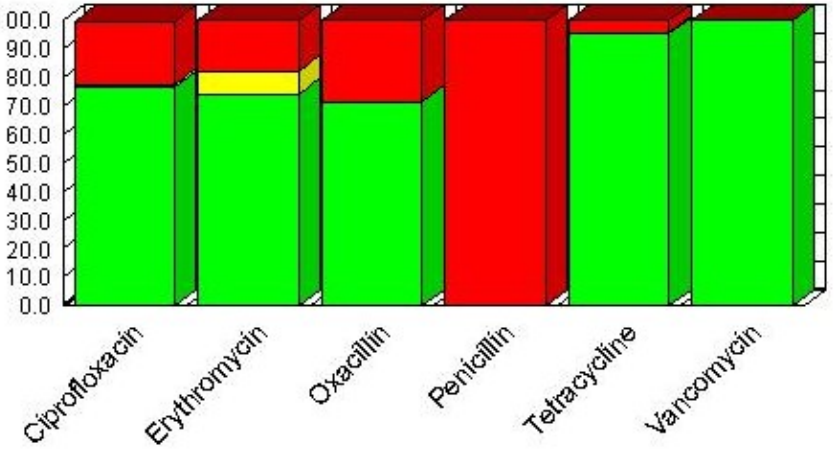
Data in TSN® Database are to be used for epidemiological purposes only and should not be used as a basis for therapy of individual patients.

Focus Technologies, Inc. must review reports before publishing or public presentation

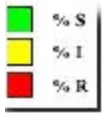
## Query Selection Criteria:

**Report Start Date:** 06/30/2001 (MM/DD/YYYY)
**Report End Date:** 06/30/2002 (MM/DD/YYYY)
**Organism:** Staphylococcus aureus
**Drug:** Ciprofloxacin;Erythromycin;Oxacillin;Penicillin;Tetracycline;Vancomycin
**Breakpoint:** NCCLS
**Institution:** A
**Trending:** None
**Dataset:** Institution
**Chosen Country:** United States

Source: TSN Database
Copyright 2002 Focus Technologies, Inc.




| Organism | Staphylococcus aureus | S | S | I | I | R | R |
|---|---|---|---|---|---|---|---|
| Drug | Total | N | % | N | % | N | % |
| Ciprofloxacin | 537 | 412 | 76.7 % | 5 | 0.9 % | 120 | 22.3 % |
| Erythromycin | 448 | 332 | 74.1 % | 37 | 8.3 % | 79 | 17.6 % |
| Oxacillin | 611 | 438 | 71.7 % | 0 | 0.0 % | 173 | 28.3 % |
| Penicillin | 6 | 0 | 0.0 % | 0 | 0.0 % | 6 | 100.0 % |
| Tetracycline | 560 | 535 | 95.5 % | 2 | 0.4 % | 23 | 4.1 % |
| Vancomycin | 570 | 570 | 100.0 % | 0 | 0.0 % | 0 | 0.0 % |



# S,I,R Phenotype Subselect

**Organism(s):** The following organisms are confirmed for your S,I,R subselect query:

- Staphylococcus aureus

**You may select up to 5 drug/result combinations. Please select the drug(s) and result(s) for the S,I,R results you wish to query and hit "Next Step" when you are finished. Identical combinations will be ignored.**

| Drug | Result |
|---|---|
| Oxacillin | Resistant |
| NONE | NONE |
| NONE | NONE |
| NONE | NONE |
| NONE | NONE |

Next Step

Create Query

Save Query

Save Template Page

Schedule Query Page

Export

Edit

Query Status Page

Help Guide

# Organisms vs. Antimicrobial Agents (%S,I,R) Report

**Report Name:** demo institute MRSA

Data in TSN® Database are to be used for epidemiological purposes only and should not be used as a basis for therapy of individual patients.

Focus Technologies, Inc. must review reports before publishing or public presentation

## Query Selection Criteria:

**S,I,R Phenotype Subselect:** Oxacillin: Resistant or Intermediate
**Report Start Date:** 06/30/2001 (MM/DD/YYYY)
**Report End Date:** 06/30/2002 (MM/DD/YYYY)
**Organism:** Staphylococcus aureus
**Drug:** Ciprofloxacin;Erythromycin;Penicillin;Tetracycline;Vancomycin
**Breakpoint:** NCCLS
**Institution:** A
**Trending:** None
**Dataset:** Institution
**Chosen Country:** United States

Source: TSN Database
Copyright 2002 Focus Technologies, Inc.

| Organism | Staphylococcus aureus | S | S | I | I | R | R |
|---|---|---|---|---|---|---|---|
| Drug | Total | N | % | N | % | N | % |
| Ciprofloxacin | 123 | 30 | 24.4 % | 0 | 0.0 % | 93 | 75.6 % |
| Erythromycin | 78 | 8 | 10.3 % | 7 | 9.0 % | 63 | 80.8 % |
| Penicillin | 4 | 0 | 0.0 % | 0 | 0.0 % | 4 | 100.0 % |
| Tetracycline | 128 | 123 | 96.1 % | 0 | 0.0 % | 5 | 3.9 % |
| Vancomycin | 130 | 130 | 100.0 % | 0 | 0.0 % | 0 | 0.0 % |

# Organisms vs. Antimicrobial Agents (%S,I,R) Report

**Report Name:** demo institute MSSA

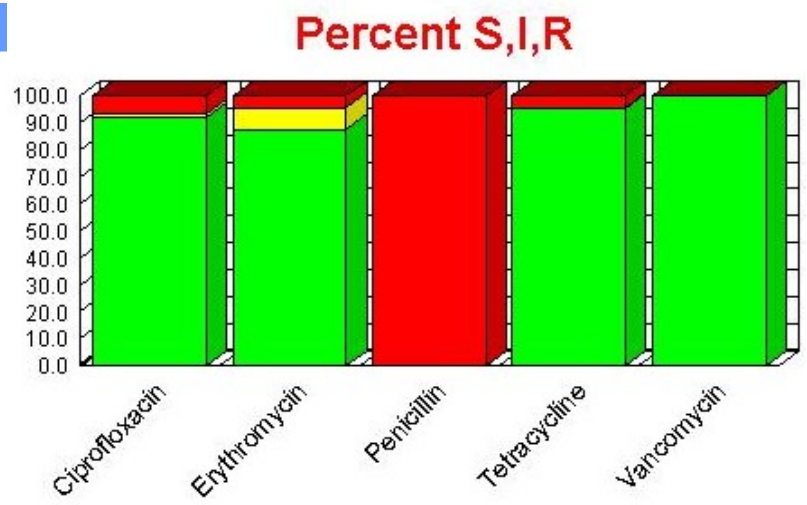
Data in TSN® Database are to be used for epidemiological purposes only and should not be used as a basis for therapy of individual patients.

Focus Technologies, Inc. must review reports before publishing or public presentation

## Query Selection Criteria:

| | |
|---|---|
| **S,I,R Phenotype Subselect:** | Oxacillin: Susceptible |
| **Report Start Date:** | 06/30/2001 (MM/DD/YYYY) |
| **Report End Date:** | 06/30/2002 (MM/DD/YYYY) |
| **Organism:** | Staphylococcus aureus |
| **Drug:** | Ciprofloxacin;Erythromycin;Penicillin;Tetracycline;Vancomycin |
| **Breakpoint:** | NCCLS |
| **Institution:** | A |
| **Trending:** | None |
| **Dataset:** | Institution |
| **Chosen Country:** | United States |

Source: TSN Database
Copyright 2002 Focus Technologies, Inc.




| Organism | Staphylococcus aureus | S | S | I | I | R | R |
|---|---|---|---|---|---|---|---|
| Drug | Total | N | % | N | % | N | % |
| Ciprofloxacin | 412 | 380 | 92.2 % | 5 | 1.2 % | 27 | 6.6 % |
| Erythromycin | 368 | 323 | 87.8 % | 29 | 7.9 % | 16 | 4.3 % |
| Penicillin | 2 | 0 | 0.0 % | 0 | 0.0 % | 2 | 100.0 % |
| Tetracycline | 430 | 410 | 95.3 % | 2 | 0.5 % | 18 | 4.2 % |
| Vancomycin | 437 | 437 | 100.0 % | 0 | 0.0 % | 0 | 0.0 % |

Create Query

Save Query

Save Template Page

Schedule Query Page

Export

Edit

Query Status Page

Help Guide

# Organisms vs. Antimicrobial Agents (%S,I,R) Report

**Report Name:** demo region MRSA

Data in TSN® Database are to be used for epidemiological purposes only and should not be used as a basis for therapy of individual patients.

Focus Technologies, Inc. must review reports before publishing or public presentation

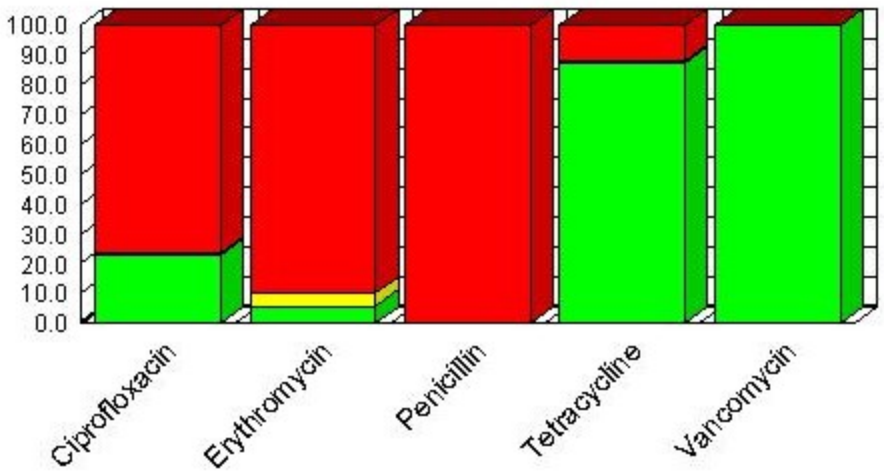
## Query Selection Criteria:

| | |
|---|---|
| **S,I,R Phenotype Subselect:** | Oxacillin: Resistant |
| **Report Start Date:** | 06/30/2001 (MM/DD/YYYY) |
| **Report End Date:** | 06/30/2002 (MM/DD/YYYY) |
| **Organism:** | Staphylococcus aureus |
| **Drug:** | Ciprofloxacin;Erythromycin;Penicillin;Tetracycline;Vancomycin |
| **Breakpoint:** | NCCLS |
| **Region:** | **Region A** |
| **Trending:** | None |
| **Dataset:** | Region |
| **Chosen Country:** | United States |

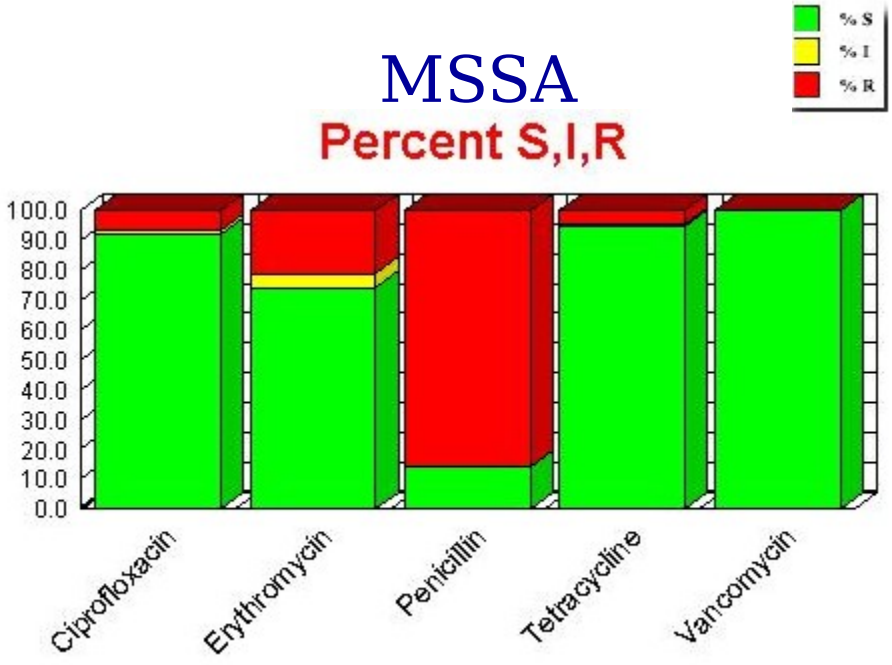
Source: TSN Database

Copyright 2002 Focus Technologies, Inc.

MRSA




MSSA



Create Query

Save Query

Save Template Page

Schedule Query Page

Export

Edit

Query Status Page

Help Guide

# Organisms vs. Antimicrobial Agents (%S,I,R) Report

**Report Name:** demo national MRSA

Data in TSN® Database are to be used for epidemiological purposes only and should not be used as a basis for therapy of individual patients.

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## Query Selection Criteria:

| | |
|---|---|
| **S,I,R Phenotype Subselect:** | Oxacillin: Resistant |
| **Report Start Date:** | 06/30/2001 (MM/DD/YYYY) |
| **Report End Date:** | 06/30/2002 (MM/DD/YYYY) |
| **Organism:** | Staphylococcus aureus |
| **Drug:** | Ciprofloxacin;Erythromycin;Penicillin;Tetracycline;Vancomycin |
| **Breakpoint:** | NCCLS |
| **Trending:** | None |
| **Dataset:** | National |
| **Chosen Country:** | United States |

Source: TSN Database
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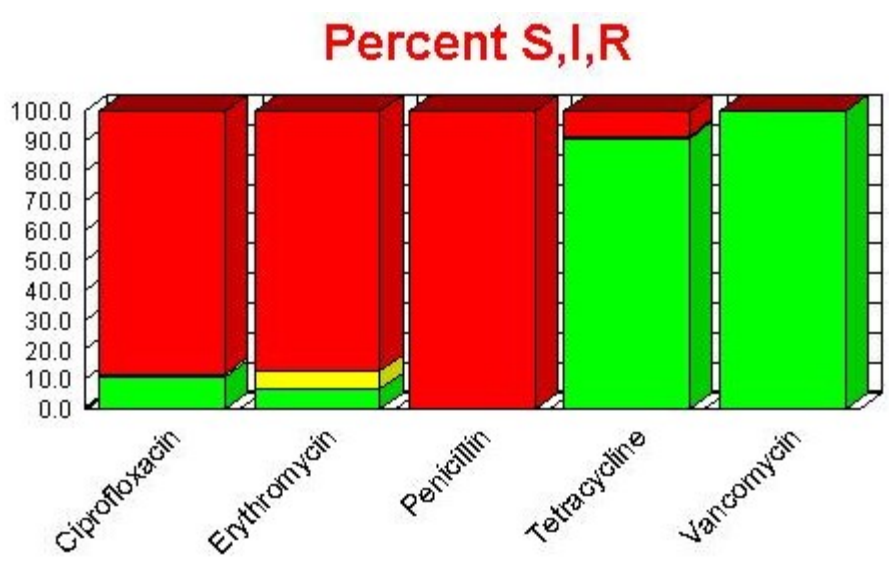
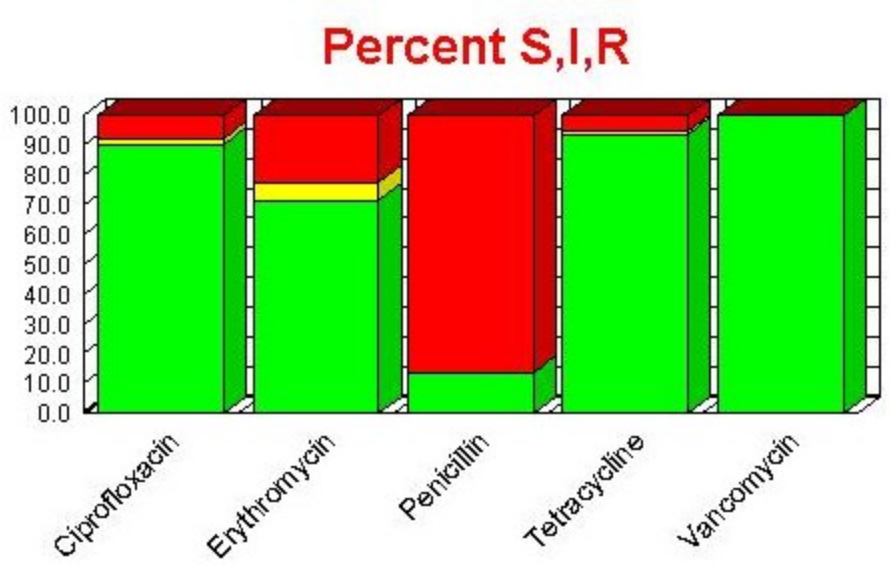
% S
% I
% R

MRSA




MSSA



Create Query

Save Query

Save Template Page

Schedule Query Page

Export

Edit

Query Status Page

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# Organisms vs. Antimicrobial Agents (%S,I,R) Report

**Report Name:** demo institute B MRSA

Data in TSN® Database are to be used for epidemiological purposes only and should not be used as a basis for therapy of individual patients.

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## Query Selection Criteria:

| | |
|---|---|
| **S,I,R Phenotype Subselect:** | Oxacillin: Resistant |
| **Report Start Date:** | 06/30/2001 (MM/DD/YYYY) |
| **Report End Date:** | 06/30/2002 (MM/DD/YYYY) |
| **Organism:** | Staphylococcus aureus |
| **Drug:** | Ciprofloxacin;Erythromycin;Penicillin;Tetracycline;Vancomycin |
| **Breakpoint:** | NCCLS |
| **Institution:** | B Medical Center |
| **Trending:** | None |
| **Dataset:** | Institution |
| **Chosen Country:** | United States |

Source: TSN Database

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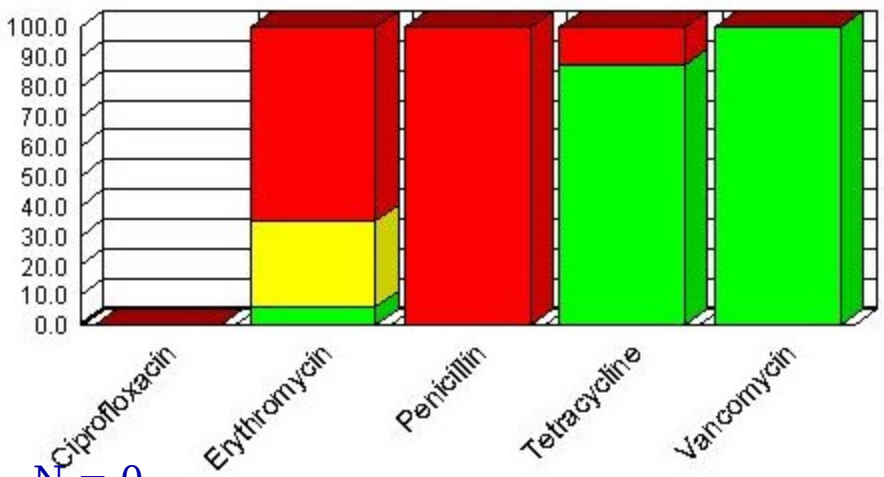
% S
% I
% R

MRSA

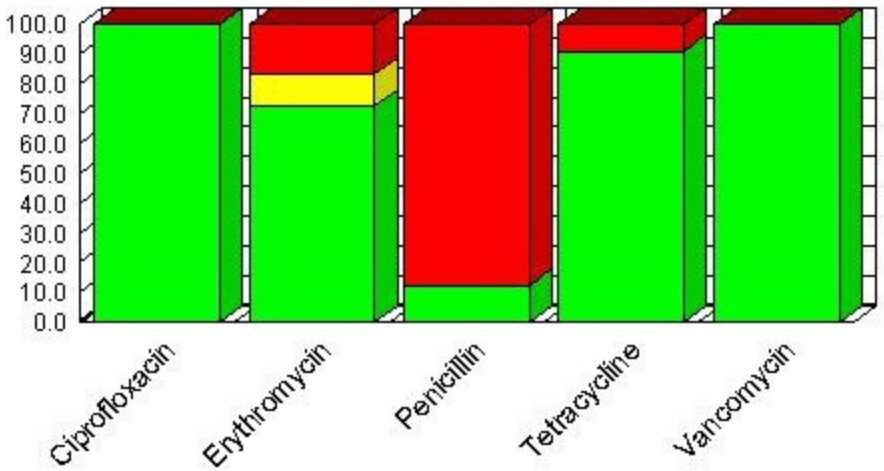
Percent S,I,R



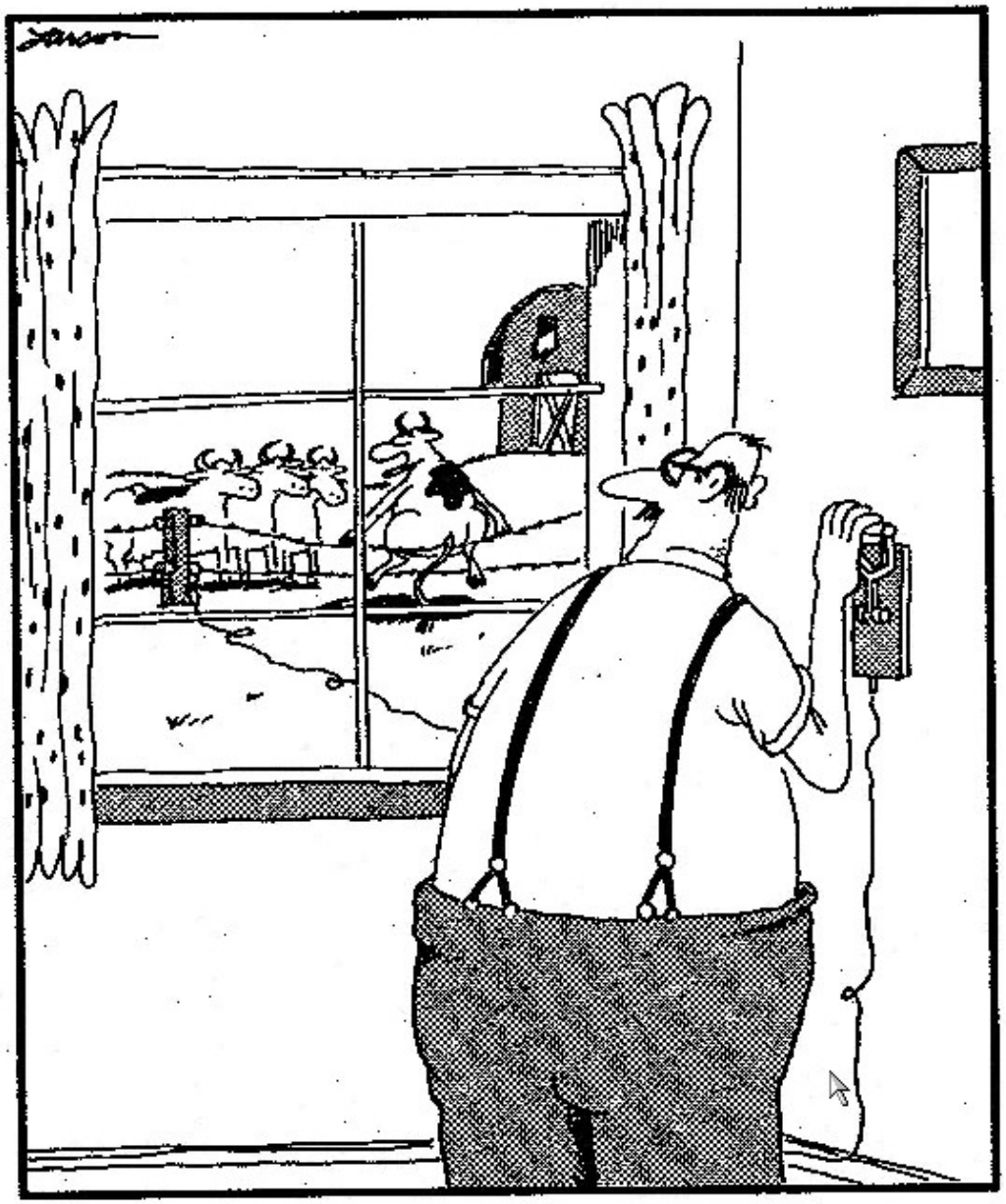

N = 0

MSSA

Percent S,I,R




N = 2



"Look, if it was electric, could I do this?"

# Developing a DoD Program on AR

Framework:

Components:

Laboratory surveillance, pharmacy data on usage, patient and provider education, clinical prevention and control activities, and interagency and international collaboration and cooperation.

Result:

Prudent use of antimicrobials in the Do

# Thank You

Buddy Eberly

Ron Masters

Amy Ray

Sherry Trevino

LOUIS PASTEUR, AFTER DISCOVERING THAT MICROBES TRANSMIT DISEASE, EXPERIMENTED WITH METHODS FOR KILLING THEM